

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A resin tube-equipped quick connector for connecting a fuel-transporting resin tube to a mating pipe, comprising a connector body, a C-shaped retainer and a seal member;

wherein the connector body has a generally tubular shape as a whole, has a retainer holding portion adapted to receive and hold the C-shaped retainer in an axial opening at one axial end thereof, and also has at an opposite axial end thereof, a press-fitting portion which is press-fitted into the interior of the resin tube from one end thereof,

wherein the press-fitting portion 28 is provided with the following portions along an axial length L thereof, one immediately after another:

a first truncated-conical-shaped portion 28T1 extending from the ring-shaped end face 28F on a tip end 28T of the press-fitting portion 28;

a first cylindrical-shaped root portion 28R,

a first truncated-conical-shaped annular projection 46 followed by a second cylindrical-shaped root portion 28R,

a second truncated-conical-shaped annular projection 46 followed by a third cylindrical-shaped root portion 28R,

a second truncated-conical-shaped portion 28T2, which ends abutting with a ring-shaped end face 18F of the connector body 18,

wherein the retainer holding portion includes first and second windows opening through opposite curved sides thereof,

wherein the C-shaped retainer includes a first arc-shaped portion which projects outwardly into the first window of the retainer holding portion, and a second arc-shaped portion which projects outwardly into the second window of the retainer holding portion,

wherein the C-shaped retainer includes a retainer-side retaining engagement portion having first and second arc-shaped openings which are adapted to engage with a convex pipe-side engagement portion, formed on an outer peripheral surface of the mating pipe and spaced from an axial insertion-side end thereof, so as to fix the inserted mating pipe in the axial direction; and

when the mating pipe is fixed in an axial direction in the C-shaped retainer, and the C-shaped retainer is held in the connector body, the convex engagement portion of the mating pipe is visible when viewed through each of the first and second windows of the retainer holding portion,

wherein the seal member is mounted within the connector body at an inner region thereof disposed closer to the press-fitting portion than the retainer holding portion is disposed, and the seal member is brought into contact with an outer peripheral surface of an insertion end portion of the inserted mating pipe disposed closer to the to a distal end of the mating pipe than the pipe-side engagement portion is disposed, thereby forming an air-tight seal between the insertion end portion and an inner surface of the connector body; and

wherein the resin tube includes a press-fit undergoing portion into which the press-fitting portion is press-fitted.

2. (Previously Presented) The resin tube-equipped quick connector as claimed in claim 1, wherein the retainer is elastically deformable radially, the retainer-side retaining engagement portion is capable of being fitted to a body-side retaining engagement portion, formed at the retainer holding portion of the connector body, from a radially-inward side to be retained and fixed in the axial direction, the retainer also including:

at least one of an inner peripheral cam surface for elastically expanding the retainer when inserting the mating pipe into the retainer and an outer peripheral cam surface for elastically reducing the diameter of the retainer when inserting the retainer into the retainer holding portion.

3. (Cancelled)

4. (Previously Presented) The resin tube-equipped quick connector as claimed in claim 1 or 2, wherein a protector is fitted on the resin tube to cover an outer peripheral surface of the resin tube.

5. (Previously Presented) The resin tube-equipped quick connector as claimed in claim 1 or 2, wherein the resin tube has a multi-layer structure an inner layer of the resin tube is more excellent in gasoline resistance than an outer layer.

6. (Cancelled)

7. (Previously Presented) The resin tube-equipped quick connector as claimed in claim 1, wherein the resin tube includes an inner diameter of not larger than 5 mm.

8. (Currently Amended) A resin tube-equipped quick connector for connecting a fuel-transporting resin tube to a mating pipe, comprising:

a connector body, a C-shaped retainer and a seal member;

wherein the connector body has a generally tubular shape as a whole, and has a retainer holding portion adapted to receive and hold the C-shaped retainer in an axial opening at one axial end thereof, and also has at an other axial end thereof, a press-fitting portion which is press-fitted into the interior of the resin tube from one end thereof;

wherein the press-fitting portion 28 is provided with the following portions along an axial length L thereof, one immediately after another:

a first truncated-conical-shaped portion 28T1 extending from the ring-shaped end face 28F on a tip end 28T of the press-fitting portion 28;

a first cylindrical-shaped root portion 28R,

a first truncated-conical-shaped annular projection 46 followed by a second cylindrical-shaped root portion 28R,

a second truncated-conical-shaped annular projection 46 followed by a third cylindrical-shaped root portion 28R,

a second truncated-conical-shaped portion 28T2, which ends abutting with a ring-shaped end face 18F of the connector body 18,

wherein the retainer holding portion includes first and second box-shaped windows opening through opposite curved sides thereof;

wherein the C-shaped retainer includes a first arc-shaped portion which projects outwardly into the first box-shaped window of the retainer holding portion, and a second arc-shaped portion which projects outwardly into the second box shaped window of the retainer holding portion,

wherein the C-shaped retainer includes a retainer-side retaining engagement portion having first and second arc-shaped openings which are adapted to engage with a convex pipe-side engagement portion, formed on an outer peripheral surface of the mating pipe and spaced from an axial insertion-side end thereof, so as to fix the inserted mating pipe in the axial direction; and

when the mating pipe is fixed in an axial direction in the C-shaped retainer, and the C-shaped retainer is held in the connector body, the convex engagement portion of the mating pipe is visible when viewed through each of the first and second windows of the retainer holding portion,

the seal member is mounted within the connector body at an inner region thereof disposed closer to the press-fitting portion than the retainer holding portion is disposed, and the seal member is brought into contact with an outer peripheral surface of an insertion end portion of the inserted mating pipe disposed closer-to the to a distal end of the mating pipe

than the pipe-side engagement portion is disposed, thereby forming an air-tight seal between the insertion end portion and an inner surface of the connector body; and

a press-fit undergoing portion of the resin tube, into which the press-fitting portion is to be press-fitted, has an inner diameter that is expanded prior to press-fitting, and the press-fit undergoing portion is press-fitted in the tube diameter-expanded press-fit undergoing portion to be integrated therewith in a withdrawal-preventing condition.

9. (Currently Amended) The resin tube-equipped quick connector as claimed in claim 14, wherein ~~the plurality of annular projections comprises first and second annular~~ projections disposed adjacently to each other, and

the first truncated-conical-shaped annular projection is closer to a distal end of the press-fitting portion than the second truncated-conical-shaped annular projection.

10. (Currently Amended) The resin tube-equipped quick connector as claimed in claim 15, wherein ~~the plurality of annular projections comprises first and second annular~~ projections disposed adjacently to each other, and

~~among the plurality of the annular projections, the first~~ truncated-conical-shaped annular projection is ~~eldest~~ closer to a distal end of the press-fitting portion ~~than the second~~ truncated-conical-shaped annular projection.

11. (Cancelled)

12. (Previously Presented) The resin tube-equipped quick connector as claimed in claim 14, no portion of the press-fitting portion has an outer diameter larger than an outer diameter d_5 of each of the truncated-conical-shaped shaped annular projections.

13. (Previously Presented) The resin tube-equipped quick connector as claimed in claim 15, no portion of the press-fitting portion has an outer diameter larger than an outer diameter d_5 of each of the truncated-conical-shaped shaped annular projections.

14. (Currently Amended) The resin tube-equipped quick connector as claimed in claim 1,

wherein the press-fitting portion is provided along the axial length L with the following portions, one immediately after another:

a first ring-shaped face 46F between the first truncated-conical-shaped portion 46 and the second cylindrical-shaped root 28R, and

a second ring-shaped face 46F between the second truncated conical-shaped portion 46 and the third cylindrical-shaped root 28R, extending from the ring-shaped end face;

a cylindrical-shaped root portion;

a plurality of truncated conical-shaped annular projections each followed by a ring-shaped face and another cylindrical-shaped root portion;

a second truncated conical-shaped portion, which ends abutting with the ring-shaped end face of the connector body.

15. (Currently Amended) The resin tube-equipped quick connector as claimed in claim 8,

wherein the press-fitting portion is provided along the axial length L with the following portions, one immediately after another:

a first ring-shaped face 46F between the first truncated-conical-shaped portion 46 and the second cylindrical-shaped root 28R, and

a second ring-shaped face 46F between the second truncated conical-shaped portion 46 and the third cylindrical-shaped root 28R.

a first truncated-conical-shaped portion extending from the ring-shaped end face;

a cylindrical-shaped root portion;

a plurality of truncated-conical-shaped annular projections each followed by a ring-shaped face and another cylindrical-shaped root portion;

a second truncated-conical-shaped portion, which ends abutting with the ring-shaped end face of the connector body.

16. (Previously Presented) The resin tube-equipped quick connector as claimed in claim 1, further comprising a bushing mounted within the connector body at a region deeper than the retainer holding portion.

17. (Currently Amended) A coupling structure of a quick connector and a resin tube for connecting a fuel-transporting resin tube to a mating pipe, comprising: a connector body, a retainer, and a seal member;

wherein the connector body has a generally tubular shape as a whole, and has a retainer holding portion at one axial side thereof, and also has at the other side thereof a press-fitting portion which is press-fitted into the interior of the resin tube from one end thereof,

wherein the press-fitting portion 28 is provided with the following portions along an axial length L thereof, one immediately after another:

a first truncated-conical-shaped portion 28T1 extending from the ring-shaped end face 28F on a tip end 28T of the press-fitting portion 28;

a first cylindrical-shaped root portion 28R,

a first truncated-conical-shaped annular projection 46 followed by a second cylindrical-shaped root portion 28R,

a second truncated-conical-shaped annular projection 46 followed by a third cylindrical-shaped root portion 28R,

a second truncated-conical-shaped portion 28T2, which ends abutting with a ring-shaped end face 18F of the connector body 18,

wherein the retainer holding portion includes first and second windows opening through opposite curved sides thereof,

wherein the retainer is a member adapted to be held in the retainer holding portion, and includes:

a first arc-shaped portion which projects outwardly into the first window of the retainer holding portion, and a second arc-shaped portion which projects outwardly into the second window of the retainer holding portion, and

a retainer-side retaining engagement portion having first and second arc-shaped recesses which are adapted to engage with a convex or concave pipe-side engagement portion, formed on an outer peripheral surface of the mating pipe and spaced from an axial insertion-side end thereof, so as to fix the inserted mating pipe in the axial direction; and

when the mating pipe is fixed in an axial direction in the retainer, and the retainer is held in the connector body, the first and second arc-shaped recesses engaging the convex or concave pipe-side engagement portion of the mating pipe are located under each of the first and second windows of the retainer holding portion, wherein the seal member is mounted within the connector body at an inner region thereof disposed closer to the press-fitting portion than the retainer holding portion is disposed, and the seal member is brought into contact with an outer peripheral surface of an insertion end portion of the inserted mating pipe disposed closer to the to a distal end of the mating pipe than the pipe-side engagement portion is disposed, thereby forming an air-tight seal between the insertion end portion and an inner surface of the connector body; and

wherein the resin tube is a small-diameter tube having an inner diameter of not larger than 5 mm,

wherein the resin tube includes a press-fit undergoing portion into which the press-fitting portion is press-fitted.

18. (Previously Presented) The coupling structure of a quick connector and a resin tube as in claim 17, wherein the retainer is elastically deformable radially, and the retainer-side retaining engagement portion is capable of being fitted to a body-side retaining engagement portion, formed at the retainer holding portion of the connector body, from a radially-inward side to be retained and fixed in the axial direction, the retainer also including:

at least one of an inner peripheral cam surface for elastically expanding the retainer when inserting the mating pipe into the retainer and an outer peripheral cam surface for elastically reducing the diameter of the retainer when inserting the retainer into the retainer holding portion.

19. (Previously Presented) The coupling structure of a quick connector and a resin tube as in claim 17, further comprising a protector fitted on the resin tube to cover an outer peripheral surface of the resin tube.

20. (Previously Presented) The coupling structure of a quick connector and a resin tube as in claim 17, where the resin tube has a multi-layer structure, having at least an inner

layer and an outer layer, the inner layer being more resistant to gasoline than is the outer layer.

21. (Previously Presented) The coupling structure of a quick connector and a resin tube as in claim 17, wherein the resin tube comprises a polyamide resin.

22. (Currently Amended) The coupling structure of a quick connector and a resin tube as in claim 17,

wherein the press-fitting portion comprises:

annular projections formed respectively on a plurality of axially different portions of a outer peripheral surface of the press-fitting portion,

wherein an outer diameter d_6 of a root portion provided between adjacent the first and second truncated-conical-shaped annular projections and an inner diameter d_3 of the tube diameter-expanded press-fit undergoing portion are substantially the same, and

wherein an axial the axial length L of the press-fitting portion and an axial length L of the press-fitting undergoing portion are substantially the same.

23. (Previously Presented) The resin tube-equipped quick connector as claimed in claim 1, wherein before the press-fitting portion is press-fitted into the press-fit undergoing portion, the press-fit undergoing portion is formed with an inner diameter that is substantially

equal to an outer diameter of the root portions of the press-fitting portion, and after the press-fitting portion is press-fitted into the press-fit undergoing portion of the resin tube, the press-fit undergoing portion is adapted to cause portions of its inner diameter facing the root portions to become equal to the outer diameter of the root portions, so that and the press-fit undergoing portion is integrated with the press-fitting portion in a withdrawal-preventing condition.